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17. The device of claim 13 wherein said layer is a metal oxide layer and said resistance body is made of a ceramic material.

18. The device of claim 17 wherein a helix is formed into said resistance layer by said process.

13 19. A miniaturized evaporation device for volatile substances such as insecticides, aromatics, and the like of the type which includes a housing; a heating unit disposed in said housing having a heating block and an electric resistance element carried by said heating block to heat the heating block; a container for a substance to be evaporated carried by said housing; and a wick inserted into said container having a wick end extending from the container for the evaporation of the substance in said container; wherein the improvement comprises:

a heating unit including an electric resistance element which includes a rod-shaped resistance body coated in at least some areas with a processed resistance layer;

said processed resistance layer being processed in prescribed layer areas to provide a desired resistance value according to the evaporation temperature required for evaporation of the volatile substance in said container so that a heating unit with small dimensions and miniaturized evaporation device are provided;

a housing having an upper shell;

said container for containing said volatile substance carried by said housing; and said heating unit being carried between said upper shell and said container.

Remarks

In the Office action mailed April 10, 2002, claim 8 is rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention. Lack of proper antecedent basis is pointed out in the rejection.

In the Office action claims 13-15 are rejected under 35 USC 102(b) as being anticipated by Schimanski et al (US 5,222,186). Claims 13-15 are further rejected under 35 USC 102(e) as being clearly anticipated by Ruffolo et al (US 6,236,807).

In the Office action claims 1, 2, 5-12 and 16 are rejected under 35 USC 103(a) as being unpatentable over Schimanski et al or Ruffolo et al in view of Barrington (US 3,414,864). Schimanski et al or Ruffolo et al is said to show an evaporation device including a housing, a heating unit disposed in the housing having a heating block, an electric resistance element carried by the heating block, and a container with a wick. The rejection notes that the claimed electric resistance element including a rod-shaped resistance body coated with a resistance layer is not shown in the references. The rejection concludes it would be obvious to one of ordinary skill in the art to adapt Schimanski et al or Ruffolo et al with the heating element shown in Barrington as an alternative heating element that can provide an accurate electric resistance to generate an accurate desired heating temperature.

In the Office action claims 3, 4 and 17-20 are rejected under 35 USC 103(a) as being unpatentable over Schimanski et al or Ruffolo et al in view of Barrington as applied to claims 1, 2, 5-12 and 16 above, and further in view of Plough Jr et al (US 4,498,071). The rejection states that, in view of Plough Jr et al, it would have been obvious to one of ordinary skill in the art to adapt Schimanski et al or Ruffolo et al as modified by Barrington, with a nickel/chrome alloy resistance layer coated on an aluminum ceramic substrate to provide a heating element that can provide a stable heating over a broad temperature range.

Applicant responds to the Office action, and respectfully requests allowance of the claims for the following reasons.

Claim 9 has been amended to provide proper antecedent basis for the terms "upper shell" and "lower shell." Claims 8 and 9 are now believed to be in full accord with USC 112, second paragraph.

The rejection based on Schimanski or Ruffolo is respectfully traversed. Both Schimanski and Ruffolo, as well as all other prior art documents provided in the background section of the present application, only show the use of traditional wire resistors as heating elements. The traditional wire resistors can stand a bigger load, i.e., a high voltage, and therefore are used for heating purposes. There is no prior art which shows the use of film resistors, such as Barrington and Plough, as a heating element in an evaporation device. This means that persons skilled in the art are not provided any hint from prior art related to evaporation devices to use film resistors as a heating element.

Accordingly, up to now, it has to be considered that film resistors have not been used as heating elements because the film resistors are known to not produce as much heat as traditional wire resistors like, for example, a coil resistor. This is one of the main reasons why such film resistors are used in devices, for example into television, radio, and other electronic devices within which high temperatures should not be achieved. This means, as concerns heating elements, that film resistors are not an equivalent for wire resistors. The person of ordinary skill in the art would have provided a film resistor as a heating element, especially for evaporation purposes, before having the benefit of the disclosure of the present invention. Therefore, as far as the applicant can trace back, the applicant is the first to insert film resistors as heating elements into

evaporation devices. This provides expedients not provided before in evaporation devices, i.e., compact miniature devices with sufficient heat and customization depending on the application.

Barrington and Plough, therefore, would not teach or give any hint to the use of film resistors described in those references as heating elements. Particularly, Barrington and Plough would not teach or render obvious the use of film resistors as heating elements in evaporation devices as claimed and disclosed in the present invention. There is no teaching or hint to combine the teaching of Barrington and Plough with Schimanski or Ruffolo. Any tendency to combine the teachings of Barrington and Plough is gained strictly by having the advantage of the present disclosure. The use of film resistors in evaporation devices is a totally new technique in the field of evaporation devices and leads to the advantage of miniaturized shape, better security, and lower cost.

Independent claims 1 and 19 are set forth this unobvious combination, and are believed to be allowable over the art. Dependent claims 2-12, 14-18, and 20 are believed to be allowable for the same reasons, and because of the additional limitations therein.

Independent claim 13 is cancelled. Accordingly, all the claims, now pending, are believed to be in condition for allowance.

In view of the above remarks and amendments, favorable action on the application is respectfully requested in due course of Patent Office business.

Respectfully submitted,



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August 12, 2002

MARKED UP COPY SHOWING CHANGES TO CLAIMS

9. The device of claim 8 including an upper shell and a lower shell wherein said base plate of said connection plug and said heating unit [is] are clamped between the upper shell and the lower shell.

14. The device of claim [13] 19 wherein said heating unit includes a heating block having a wick passage disposed between said upper and lower shells; and said wick end extending through said wick passage.

16. The device of claim [15] 19 wherein said [heating element includes a cylindrical body having a] resistance layer [which] is processed by one of cutting and grinding in some areas to provide [a] said desired resistance value, [according to the evaporation temperature required for evaporation of the substance in said container so that a heating unit with small dimensions and miniaturized evaporation device are provided.]

17. The device of claim [16] 19 wherein said layer is a metal oxide layer and said resistance body is made of a ceramic material.

18. The device of claim [16] 17 wherein a helix is formed into said resistance layer by said process.

19. A miniaturized evaporation device for volatile substances such as insecticides, aromatics, and the like of the type which includes a housing; a heating unit disposed in said housing having a heating block and an electric resistance element carried by said heating block to heat the heating block; a container for a substance to be evaporated carried by said housing; and a wick inserted into said container having a wick end extending from the container for the evaporation of the substance in said container; wherein the improvement comprises:

a heating unit including an electric resistance element which includes a rod-shaped resistance body coated in at least some areas with a processed resistance layer;

said processed resistance layer being processed [by one of cutting and grinding] in [some] prescribed layer areas to provide a desired resistance value according to the evaporation temperature required for evaporation of the volatile substance in said container so that a heating unit with small dimensions and miniaturized evaporation device are provided;

a housing having an upper shell;

said container for containing said volatile substance carried by said housing; and said heating unit being carried between said upper shell and said container.